

CLAIMS**1. A method comprising:**

(i) applying a photopatternable silicone composition to a surface of a substrate;

5 (ii) exposing a portion of the film to radiation to produce a partially exposed film having non-exposed regions covering at least a portion of the surface and exposed regions covering the remainder of the surface;

(iii) heating the partially exposed film for an amount of time such that the exposed regions are substantially insoluble in a developing solvent and the non-exposed regions are soluble in the developing solvent;

10 (iv) removing the non-exposed regions of the heated film with the developing solvent to form a patterned film;

(v) heating the patterned film; and

(vi) removing all or a portion of the product of step (v).

15 2. A method comprising:

(i) applying a photopatternable silicone composition to a surface of a substrate;

(ii) exposing a portion of the film to radiation to produce a partially exposed film having non-exposed regions covering at least a portion of the surface and exposed regions covering the remainder of the surface;

20 (iii) heating the partially exposed film for an amount of time such that the exposed regions are substantially insoluble in a developing solvent and the non-exposed regions are soluble in the developing solvent;

(iv) removing the non-exposed regions of the heated film with the developing solvent to form a patterned film;

25 (v) removing all or a portion of the patterned film.

3. The method of claim 1 or claim 2, where the substrate is an active surface of a semiconductor wafer.

30 4. The method of claim 1 or claim 2, where the photopatternable silicone composition comprises:

(A) an organopolysiloxane containing an average of at least two silicon-

bonded alkenyl groups per molecule,

(B) an organosilicon compound containing an average of at least two silicon-bonded hydrogen atoms per molecule in a concentration sufficient to cure the composition, and

5 (C) a catalytic amount of a photoactivated hydrosilylation catalyst.

5. The method of claim 1 or claim 2, where the removing step is carried out using an etching solution comprising an organic solvent and a base.

10 6. The method of claim 5, where the etching solution contains no more than 25% water based on the weight of the etching solution.

7. The method of claim 5, where the organic solvent is selected from a monohydric alcohol, a dihydric alcohol, a monoether, a diether, a polar aprotic solvent, and combinations thereof.

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8. The method of claim 5, where the base is selected from ammonium hydroxide, cesium hydroxide, potassium hydroxide, sodium hydroxide, and combinations thereof.

20 9. The method of claim 5, where the base is selected from phosphazene, tetraalkyl ammonium hydroxides, and combinations thereof.

10. Use of the method of claim 1 or claim 2 for rework, photoresist, or cleaning applications.

AMENDED CLAIMS

[received by the International Bureau on 27 April 2004 (27.04. 04);
original claims 1-10 replaced by amended claims 1-10 (2 pages)]

1. A method comprising:

(i) applying a photopatternable silicone composition to a surface of a substrate to form a film, where the photopatternable silicone composition comprises

5 (A) an organopolysiloxane containing an average of at least two silicon-bonded alkenyl groups per molecule,

(B) an organosilicon compound containing an average of at least two silicon-bonded hydrogen atoms per molecule in a concentration sufficient to cure the composition, and

(C) a catalytic amount of a photoactivated hydrosilylation catalyst;

10 (ii) exposing a portion of the film to radiation to produce a partially exposed film having non-exposed regions covering at least a portion of the surface and exposed regions covering the remainder of the surface;

(iii) heating the partially exposed film for an amount of time such that the exposed regions are substantially insoluble in a developing solvent and the non-exposed regions are soluble in
15 the developing solvent;

(iv) removing the non-exposed regions of the heated film with the developing solvent to form a patterned film;

(v) heating the patterned film; and

(vi) removing all or a portion of the product of step (v).

20 2. A method comprising:

(i) applying a photopatternable silicone composition to a surface of a substrate to form a film, where the photopatternable silicone composition comprises

25 (A) an organopolysiloxane containing an average of at least two silicon-bonded alkenyl groups per molecule,

(B) an organosilicon compound containing an average of at least two silicon-bonded hydrogen atoms per molecule in a concentration sufficient to cure the composition, and

(C) a catalytic amount of a photoactivated hydrosilylation catalyst;

30 (ii) exposing a portion of the film to radiation to produce a partially exposed film having non-exposed regions covering at least a portion of the surface and exposed regions covering the remainder of the surface;

(iii) heating the partially exposed film for an amount of time such that the exposed regions are substantially insoluble in a developing solvent and the non-exposed regions are soluble in the developing solvent;

(iv) removing the non-exposed regions of the heated film with the developing solvent to
5 form a patterned film;

(v) removing all or a portion of the patterned film.

3. The method of claim 1 or claim 2, where the substrate is an active surface of a semiconductor wafer.

10 4. The method of claim 1 or claim 2, where the removing step is carried out using an etching solution comprising an organic solvent and a base.

15 5. The method of claim 4, where the etching solution contains no more than 25% water based on the weight of the etching solution.

6. The method of claim 4, where the organic solvent is selected from a monohydric alcohol, a dihydric alcohol, a monoether, a diether, a polar aprotic solvent, and combinations thereof.

20 7. The method of claim 4, where the base is selected from ammonium hydroxide, cesium hydroxide, potassium hydroxide, sodium hydroxide, and combinations thereof.

8. The method of claim 4, where the base is selected from phosphazene, tetraalkyl ammonium hydroxides, and combinations thereof.

25 9. The method of claim 1 or claim 2, where the removing step is carried out using an etching solution comprising: a) tetramethylammonium hydroxide pentahydrate and isopropyl alcohol; b) cesium hydroxide, water, and isopropyl alcohol; c) potassium hydroxide and isopropyl alcohol; d) tetramethylammonium hydroxide pentahydrate, water, and isopropyl alcohol; or e)
30 tetramethylammonium hydroxide pentahydrate and 1-methoxy-2-propanol.

10. Use of the method of claim 1 or claim 2 for rework, photoresist, or cleaning applications.